

ABSTRACT

Provided in a preferred embodiment is an application of phase profilometry to determine the 3-D configuration of normally obscured structure. In one application, the undercarriage of a vehicle is captured in a 3-D profile while the vehicle is operating normally. The system may use a digital camera; a computer for control, communications, processing, comparing configurations and database storage; a broadband light source; and a device positioned between the light and structure that enables an alternating strip or strips of light and shadows to impinge the obscured surface. A preferred embodiment uses a single straight edge as the device. In addition to profiling the undercarriage of a vehicle and comparing it to an expected configuration of a like vehicle, the system may be used for such diverse applications as determination of correct toll at toll booths, quality inspection in an assembly line, safety and security inspections, and access control.

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